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BUREAU OF DAIRY INDUSTRY

Issued July, 1929

WILD GARLIC AND ITS CONTROL

LEAFLET NUMBER 43

U.S. DEPARTMENT OF AGRICULTURE

WILD GARLIC AND ITS CONTROL[1]

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WILD GARLIC (*Allium vineale*), a very troublesome weed in fields of small grain, in pastures, and in lawns, is common and generally abundant along the Atlantic coast region from Massachusetts to Georgia and inland to Missouri, Arkansas, and Mississippi. Locally, it has reached somewhat farther westward, and it is still spreading.

Garlicky wheat produces garlic-tainted bread. Wheat fields infested with garlic, therefore, cause the wheat grower a heavy dockage at the mill. In addition, they increase the cost of manufacturing flour. The garlic bulblets are about the size of wheat grains and are therefore difficult to separate from wheat, especially from freshly threshed grain. The weed likewise causes serious loss to the dairy industry. It is difficult either to market or to manufacture into salable dairy products the tainted milk produced by cows that graze on garlic-infested pastures.

Description of the Plant

Successful eradication of wild garlic depends upon a knowledge of its life habits. In cultivated lands the plants are likely to be scattered, but in pastures, lawns, and other places that have not been disturbed for several years the plants grow in clumps, as shown in the illustration on the title-page. Throughout most of its range garlic ripens in June or July, at which time the stem is 1½ to 3½ feet tall and is capped by a cluster of aerial bulblets often incorrectly called "seeds." True seeds are produced only rarely. At maturity from two to six newly formed bulbs usually are found at the base of the plant, between the leaf layers of the old bulb and from 1 to 8 inches under the surface of the soil. The stem and leaves soon die, leaving these new bulbs to start new plants. The large central bulb has a thin, delicate, white skin, but the smaller ones have a hard brown shell. The large soft-shelled bulb germinates in summer or early fall. A few of the smaller hard-shelled bulbs start growth in late fall, but most of them remain dormant until the following spring or even a later period. It has been found that before all the hard-shelled bulbs have germinated plants from the soft-shelled bulbs have begun to produce new bulbs. Reproducing as it does by hard-shelled bulbs, soft-shelled bulbs, aerial bulblets, and sometimes by seeds, the plant is renewed practically continuously. This is the secret of the remarkable persistence of the weed.

[1] Much of the information in this leaflet is drawn from experiments conducted previous to 1919 by H. R. Cox, J. S. Cates, H. R. Cates, and A. A. Hansen, formerly of the U. S. Department of Agriculture.

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Confusion with Other Plants

Other names for wild garlic are garlic, meadow garlic, field garlic, onion, and wild onion. The name "wild onion," however, is applied also to several closely related but quite different plants. This results in confusion. Over much of the range occupied by wild garlic, and also farther north and farther south, occurs one of the most common of these "wild onions." Its technical name is *Allium canadense.* Its leaves are flattened in cross section and are borne only near the base of the stem, which rises from a single underground bulb inclosed in old plants by a rough netlike covering. In contrast, wild garlic (*A. vineale*) has hollow, slender, cylindrical leaves borne up to and above the middle of the slender stem. Underground, it has a cluster of bulbs (fig. 1) with somewhat fibrous but not netlike coverings.

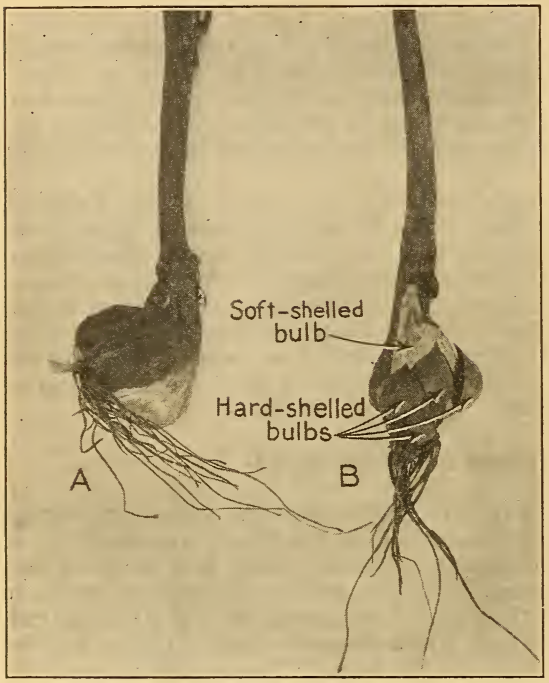

FIGURE 1.—Wild garlic: A, Lower portion of mature plant, freed from soil; B, similar plant with outer covering removed from the bulbs. (Photograph from the extension department of Purdue University)

Farmers and dairymen should be able to recognize wild garlic, as it is more difficult to eradicate than the other species. The Office of Botany, Bureau of Plant Industry, United States Department of Agriculture, will gladly identify specimens of doubtful plants, but care should be taken in forwarding the specimen to include the bulbs with the plants.

Cultural Method of Killing Garlic on Cultivated Land

Timely plowing late each fall and again in early spring and the subsequent growing of thoroughly cultivated row crops are the essential steps in the so-called cultural method of controlling wild garlic, a method based on the experience of farmers and on experiments conducted by the Department of Agriculture and by several State experiment stations. In most places this system must be followed for at least three years in order to obtain a satisfactory clean-up of garlic.

The object of fall plowing is to destroy (1) the plants from the soft-shelled bulbs which usually sprout in late summer or early fall and (2) the weak plants from recently germinated aerial bulblets. Spring plowing kills multitudes of plants from the hard-shelled bulbs that have lain in the ground over winter. Other plants from these hard-shelled bulbs appear in late spring and summer and are best destroyed by growing in checkrows some intertilled crop, such as corn or soybeans, which should be given a little extra cultivation.

Details of Cultural Control Method

Fairly deep plowing, the first step in this system, should be started in the fall in time to destroy the plants grown from soft-shelled bulbs before they have advanced far enough to produce new bulbs. The best time for such plowing is when most of the plant food from the bulb has been used in producing the top and before new bulbs have started to form. This condition exists during a considerable period when the new plants are about 10 to 15 inches high, which is usually during October and November in the South and during November and December in the North. The proper dates of this period will vary between regions and seasons. The extension department of Purdue University recommends "about November 15" as an average date suitable in Indiana. The West Virginia experiment station suggests the period from October 10 to November 10. The Pennsylvania Department of Agriculture advises November 15 or later. In this fall plowing, the garlic tops should be buried completely; otherwise, many of them will keep on growing. A plow with a jointer attached to the beam, or with a properly adjusted chain drag, will be found helpful in turning under all the tops to a depth of at least 3 inches. Disking the land previous to plowing it will aid in accomplishing this result. The following spring the field should be plowed again and planted to an intertilled crop. Corn in checkrows is a satisfactory crop for most localities. In cultivating, the aim should be to keep down top growth of garlic plants. For this purpose, the best implements are those that cut off all the tops instead of permitting many of them to bend to one side and thus to keep on growing. Cultivators equipped with sweeps (knifelike blades) instead of shovels are recommended, unless the soil is stony or otherwise unsuited to their use.

With thorough work, the stand of garlic will be greatly thinned by the end of the second year. Formerly it was thought that two years of careful work would be sufficient, but later experience has shown that a 3-year eradication program usually is required, as occasional plants may be missed by the implements, and also some of the hard-shelled bulbs may not germinate for a year or two. Scattered garlic plants may even survive three years of treatment, if conditions for eradication have been unfavorable. Nevertheless, the cultural control method is the most practicable one so far developed for field conditions, and many farmers have had good results with it. The method is not effective, of course, on overflow lands or fields that receive the wash from garlic-infested uplands, as the bulblets often are carried by water.

Spring plowing, to be effective, must be done before the hard bulbs begin to form new bulbs. More experimental work is needed to discover the latest dates safe for various conditions and regions. In Indiana, "before the 10th of April" is recommended; in Pennsylvania, April 1 to 15; and in West Virginia, April 1 to 15, depending upon the season. On a control-demonstration area in southern Illinois, handled cooperatively in 1928 by the Gilster Milling Co., the Randolph County Farm Bureau, and the Illinois College of Agriculture, April 1 appeared to be the "dead line," for by April 10 many hard bulbs were rapidly forming, although they were not yet mature, according to an unpublished report received from E. C. Secor, farm adviser. Similar observations for two or three years in other regions would yield valuable information regarding the best time for plowing.

A wide choice is permissible in the selection of a cultivated crop. For example, Indiana indorses the use of corn, potatoes, cowpeas, or soybeans planted in rows. In West Virginia, soybeans, corn, sorghum, millet, and potatoes are suggested, but soybeans are preferred. Although, in garlic-control systems, cultivated row crops generally have been most effective, thick broadcast sowings of oats and cowpeas also have yielded promising results locally, particularly in southern Illinois. In Monroe, Randolph, and St. Clair Counties the liming of thin soils and the use of spring-sowed sweetclover for the first crop of the clean-up program are recommended by the farm advisers. The resulting soil improvement is believed to more than offset the loss of cash return from the field for one year.

Wild Garlic in Pastures

Grazing with livestock, especially sheep, for several seasons, as closely as may be safe without serious injury to the pasture, aids in keeping down the growth of garlic in steep, rocky, or wooded pastures that can not be plowed. Continued close grazing has practically eliminated the weed on certain small permanent pastures. Still, the widespread abundance of wild garlic in pastures is good evidence that grazing alone, as ordinarily practiced, is only a partial remedy and not a satisfactory cure. Future field experiments must be depended upon for the development of a satisfactory method of garlic eradication for pastures, in which the cultural-control method used on cultivated areas can not be employed.

Chemical Eradication on Small Areas

The United States Department of Agriculture has experimented with a number of the most promising plant poisons, including fuel oil, coal-tar creosote oil, arsenite-of-soda solution, and common salt. Although all these substances killed the plants, only one of them, namely, coal-tar creosote oil (crude carbolic acid), affected the ungerminated bulbs as well. It was found that about four thimblefuls of this material was fairly effective when applied directly to each clump of plants, a method applicable only to scattered plants on a small area, such as a lawn. Coal-tar creosote oil is a caustic poison which should be handled with care.

At Purdue University more recent experiments have shown that small patches of garlic can be destroyed by one spraying each year for three successive years with waste crank-case oil strained through several thicknesses of cheesecloth. The oil should be thinned with kerosene and applied with a small hand-pressure sprayer, such as a knapsack sprayer, or even with a sprinkling can. The garlic tops should be completely coated with oil, but the soil should not be saturated. In Indiana it has been found that the work should be done usually about April 15, but always before the garlic heads form. Spraying outfits should be cleaned promptly, as oil quickly destroys rubber.

Eliminating Garlic Flavor in Milk

According to the Bureau of Dairy Industry, United States Department of Agriculture, it is necessary to remove cows from garlic-infested pastures four to seven hours before milking to eliminate entirely the garlic flavor and odor from milk. Milch cows should not be turned into such pastures in the spring until suitable forage plants are large enough to furnish good grazing.

Additional Suggestions

Do not undertake to fight wild garlic on too large an acreage. The cultural control method, to be effective, must be faithfully carried through to completion.

Pulling and digging wild garlic is back-breaking work which offers little chance of success. This method is not recommended.

Prevent the formation of bulblets and seeds as far as possible by cutting the plants before maturity, if more vigorous eradication measures must be postponed.

Avoid scattering bulblets and seeds, either through using fresh stable manure or by means of uncleaned threshing machines.

Do not depend on the "hot-water treatment" of seed grain, which, in tests at Purdue University, killed only about 75 per cent of the wild-garlic bulblets.

Sow clean seed grain. Many farmers sow garlic, too.

U. S. GOVERNMENT PRINTING OFFICE: 1929

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